Hogan Lovells US LLP
Columbia Square
555 Thirteenth Street, NW
Washington, DC 20004
T +1 202 637 5600
F +1 202 637 5910
www.hoganlovells.com

September 27, 2011

Karl Simon, Director
Compliance and Innovative Strategies Division
Office of Transportation and Air Quality
United States Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

**Re: Request for Updated Scheduled Maintenance Intervals for Selective Catalytic Reduction Technologies for Model Years 2012 and Later**

Dear Mr. Simon:

In their petition dated August 18, 2011, Chrysler Group, LLC, Cummins Inc., Detroit Diesel Corp., Daimler Trucks North America LLC, Ford Motor Company, Mack Trucks Inc., PACCAR Inc., UD Trucks Corporation, and Volvo Group North America, LLC, (collectively the "SCR Engine Manufacturers") requested revised scheduled maintenance intervals for selective catalytic reduction ("SCR") technologies for model years 2012 and later pursuant to 40 C.F.R. § 86.094-25(b)(7)(ii). This letter provides additional information and data in support of that petition.

## I. Space and Weight Constraints

In EPA's November 9, 2009 Approval of New Scheduled Maintenance for Selective Catalyst Reduction Technologies (the "2009 Notice"), EPA made two related findings of fact with respect to size and weight constraints. First, EPA concluded that diesel exhaust fluid ("DEF") tank sizes were limited by weight and space constraints, and that tanks larger than those recommended by manufacturers were not reasonably feasible. EPA explained that "longer intervals than those requested by the manufacturers would require DEF tanks that are too large or too heavy to be feasibly incorporated into vehicles. . . . Because of inherent space and weight constraints in the configuration and efficient operation of heavy-duty vehicles, there are size limits on the DEF tanks."[1]

EPA explained that:

> The extra weight associated with the DEF required to meet the 2:1 or 3:1 refill intervals . . . represents a significant challenge to manufacturers seeking to meet both weight and size requirements for their vehicle designs. EPA believes that in

[1] Control of Emissions from New Highway Vehicles and Engines: Approval of New Scheduled Maintenance for Selective Catalyst Reduction Technologies, 74 Fed. Reg. 57,671, 57,673 (Nov. 9, 2009).

> light of the existing tight space constraints and the overall desire to maximize cargo-carrying capacity to minimize emissions and meet consumer operational demands, and the built-in DEF tank size buffer to insure DEF refills, that the DEF tank sizes associated with the 2:1 and 3:1 refill intervals are technologically necessary. EPA believes that requiring tank sizes above these ratios will cause increases in space constraints and weight that would not be appropriate for these vehicles.
>
> . . . EPA believes that longer refill intervals than those noted above would require larger and heavier DEF tanks, and the design and engineering work performed by manufacturers thus far indicate that the recommended DEF refill intervals noted above approximate the maximum feasible maintenance intervals associated with reasonable DEF tank sizes.[2]

There has been no increase in the space available for DEF tanks since 2009, therefore EPA's 2009 analysis and conclusions about the "tight space constraints" and maximum reasonable tank size remain accurate and valid.[3] What has changed dramatically is the level of DEF dosing, and the need to carry more DEF to meet a given DEF tank size ratio, like the 2:1 ratio. EPA's new fuel economy standards for heavy-duty on-highway trucks[4] and similar voluntary efficiency improvement measures will significantly increase the space and weight demands associated with DEF storage, unless the proposed 1:1 ratio requirement is adopted. In other words, if EPA does not approve the use of 1:1 tank size ratios, it would effectively be requiring 2:1 tanks that are significantly larger than the tank sizes that EPA previously concluded were the "maximum feasible . . . associated with reasonable DEF tank sizes."[5]

Specifically, SCR engine manufacturers are planning to use increased DEF dosing rates to meet both near and longer-term fuel economy and GHG reduction targets. The level of increased dosing needed to enable meeting those requirements is significant in many cases. DEF dosing rates vary by manufacturer, vehicle application, and in-use operating conditions, but the near-term increases are generally expected to be in the range of 25-50%. To meet the next round of GHG reduction requirements, some manufacturers expect to increase DEF dosing by as much as 100% over current levels. These increased levels of dosing will require a corresponding increase in DEF tank capacity and size to meet the existing 2:1 tank ratio requirements. For example, increasing DEF dosing by 40% on average would require an increase in DEF tank size of approximately 40% (depending on how much extra capacity was included in the tanks used in previous model years). The shape, size and location of DEF tanks on a truck frame are constrained by a number of factors including: the need to place the tank below the filler-neck; the need for clearance from other components such as fuel tanks, battery boxes, air tanks, diesel particulate filters, and the drive axle and wheels; the need for gravity feed; body installation requirements; clear-back-of-cab requirements; weight distribution requirements; bridge formula and related axle placement issues;

---

[2] Id. at 57,674.

[3] See id.

[4] Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, 76 Fed. Reg. 57,106 (Sept. 15, 2011).

[5] 74 Fed. Reg. at 57,674.

and fuel capacity/driving range demands.

The graphics attached at Appendix A depict the position and relationship between these components and the resulting space constraints associated with increasing DEF tank sizes on several Volvo applications. These graphics demonstrate that the tank sizes approved in 2009 were the largest feasible for those MY 2010 applications. As noted, there have been no changes to these trucks which would increase the amount of space available for larger DEF tanks. For numerous PACCAR trucks, the near-term tank size increase under a 2:1 rule would require an additional 10 inches of longitudinal frame rail space if the 1:1 ratio is not applied more broadly. Appendix B depicts several examples of PACCAR applications where increased DEF tank sizes for MY 2013 trucks would require significant vehicle re-engineering of the chassis and drive train, as well as the DEF storage system (including revalidation of the DEF thaw characteristics). On some truck applications the use of a larger tank would simply be impossible without a major re-design of the vehicle. On other applications, the use of a larger tank could be possible in theory, but would involve creating a custom designed tank shape for the specific application, which would be both extremely time-consuming and cost-prohibitive.

In addition to the space constraints, forcing larger DEF tanks through a 2:1 tank requirement would also increase vehicle weight in a way that is directly contrary to the objectives of EPA's recent GHG rulemaking. SCR Engine Manufacturers have looked at the weight impact. In some cases, the larger capacity would be achieved by utilizing larger DEF tanks from the existing range of tank options; in other cases, custom tanks would be required. The increase in weight associated with failure to adopt the proposed 1:1 requirement would be in the range of 100 - 110 pounds for MY 2013, assuming that the next larger existing tank size could be employed. EPA recognized that reductions in vehicle weight of as little as 80 pounds were relevant to its GHG reduction goals.[6]

## II. Lead Time and Stability

Now is the appropriate time to grant the SCR Engine Manufacturers' (b)(7) petition for all of the reasons discussed in the August 18th petition, including increased availability of DEF, significant changes in inducement strategies, and current and anticipated changes in vehicle designs. Delaying approval of reduced maintenance intervals for MY 2013 will prevent manufacturers from implementing engine and vehicle plans developed pursuant to EPA's new GHG rule and will significantly undermine those regulations. Without approval of the 1:1 tank ratio for MY 2013, manufacturers will not be able to utilize the transitional flexibilities built into the regulations, which are designed to facilitate compliance with the new GHG regulations.

One of these important GHG provisions offers the ability to begin generating $CO_2$ emissions credits with engines certified in MY 2013 pursuant to 40 C.F.R. § 1036.150(a). SCR Engine Manufacturers are planning to begin generating these credits with MY 2013 engines. Generating these credits in many cases will require the near-term levels of increased DEF dosing, and

---

[6] Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, 75 Fed. Reg. 74,152, 74,216-17 (proposed Nov. 30, 2010).

corresponding tank size increases, referenced above. In addition, a number of manufacturers will seek to use the optional compliance flexibilities associated with meeting the new $CO_2$ standards in MY 2013, such as the alternative phase-in standards of 40 C.F.R. § 1036.150(e). MY 2013 engine production can begin as early as January 2, 2012. Accordingly, it is critical that the requested use of 1:1 tank ratios be approved by EPA in the context of renewing EPA's existing (b)(7) approval, which is only applicable through MY 2011. Failure to approve this request at the same time EPA issues its (b)(7) decision for model year 2012 would essentially eliminate the production and compliance planning lead time necessary for manufacturers to utilize the MY 2013 GHG flexibility provisions of the final GHG rule.

The need to incorporate onboard diagnostic (OBD) capability in MY 2013 provides an additional and independent basis for granting the 1:1 (b)(7) petition by the end of the current calendar year. Specifically, EPA's OBD regulations for heavy-duty diesel engines will fully phase-in in MY 2013. OBD monitoring strategies must take into account engine control strategies that affect both criteria pollutant emissions and $CO_2$. If manufacturers are not able to incorporate enhanced $CO_2$ performance in MY 2013 with increased DEF dosing, they would be forced to incorporate one OBD monitoring strategy for a single model year (MY 2013), and then replace it with a new OBD strategy in MY 2014 when the $CO_2$ regulations become mandatory. In other words, if manufacturers cannot improve $CO_2$ performance for MY 2013 as desired, they would only have a single year of regulatory stability for the OBD systems that must be incorporated in MY 2013.

EPA has consistently recognized the need for adequate lead time and stability in connection with the engineering and product development necessary for manufacturers to meet emissions-related maintenance requirements. Consistent with the stability provisions of section 202 of the Clean Air Act for emissions standards, EPA's 2009 (b)(7) notice established a DEF refill interval that would remain in effect for three years, even though the EPA recognized that DEF availability was still evolving at that time.[7] As discussed in the August 18th petition, the developments since 2009 support an approval for reduced SCR maintenance intervals that would remain effective indefinitely (until such time as compelling evidence may indicate that the DEF replenishment interval should be revisited). A longer approval time period would provide greater certainty for manufacturers for planning and design purposes, thereby reducing costs and enabling manufacturers to focus on other design developments such as GHG reductions, and it would reduce the administrative burden on the agency.

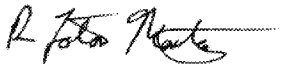
EPA should make every effort to provide maximum lead time and stability with respect to required maintenance intervals under (b)(7). Similarly, EPA should make every effort to ensure that the requirements it establishes under (b)(7) do not defeat the regulatory compliance options established by its recent GHG rulemaking. For all of the foregoing reasons, EPA should approve the SCR Engine Manufacturers' petition with respect to DEF tank sizes as soon as possible.

* * *

[7] 74 Fed. Reg. at 57,674.

We look forward to your response to this request. Please contact us if we can provide any additional information.

Sincerely,

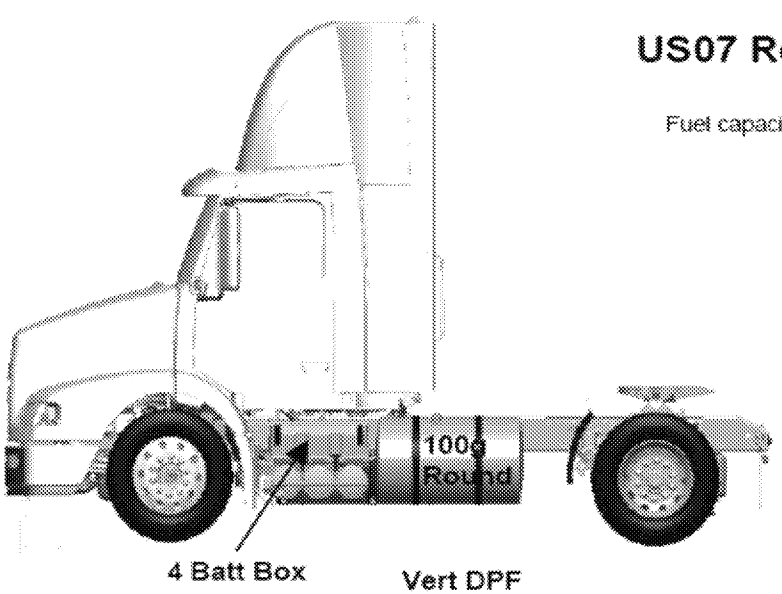


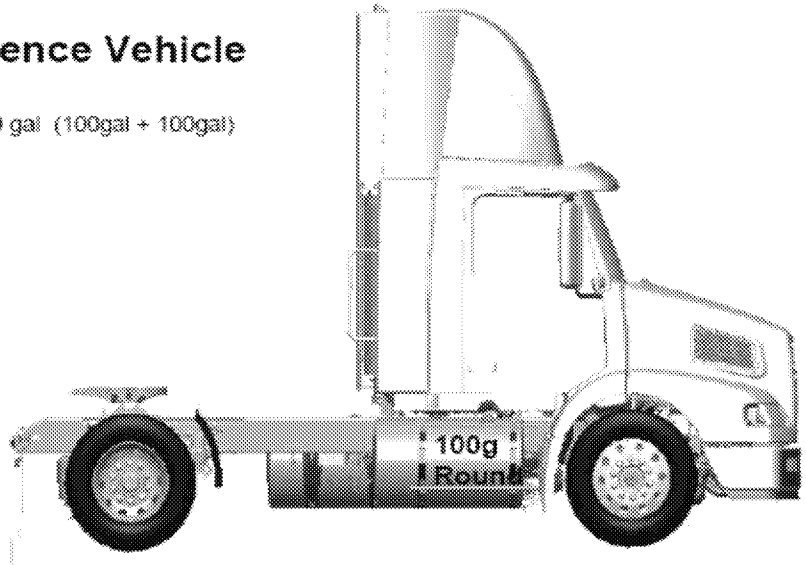
R. Latane Montague
Partner
latane.montague@hoganlovells.com
D 202.637.6567

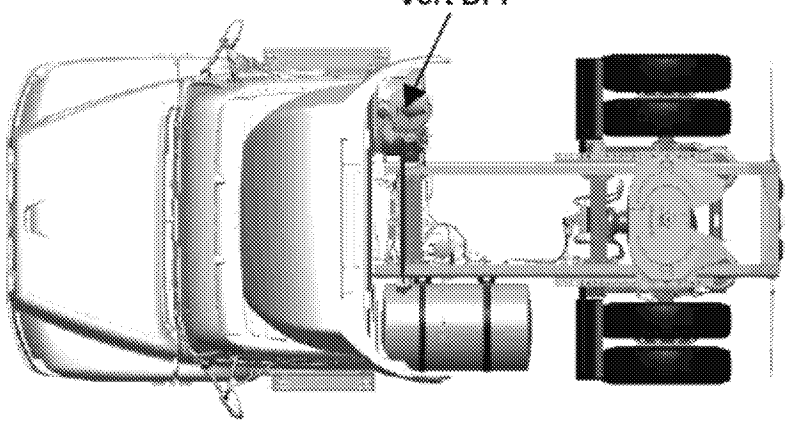
# APPENDIX A

## US07 Reference Vehicle

Fuel capacity: 200 gal (100gal + 100gal)



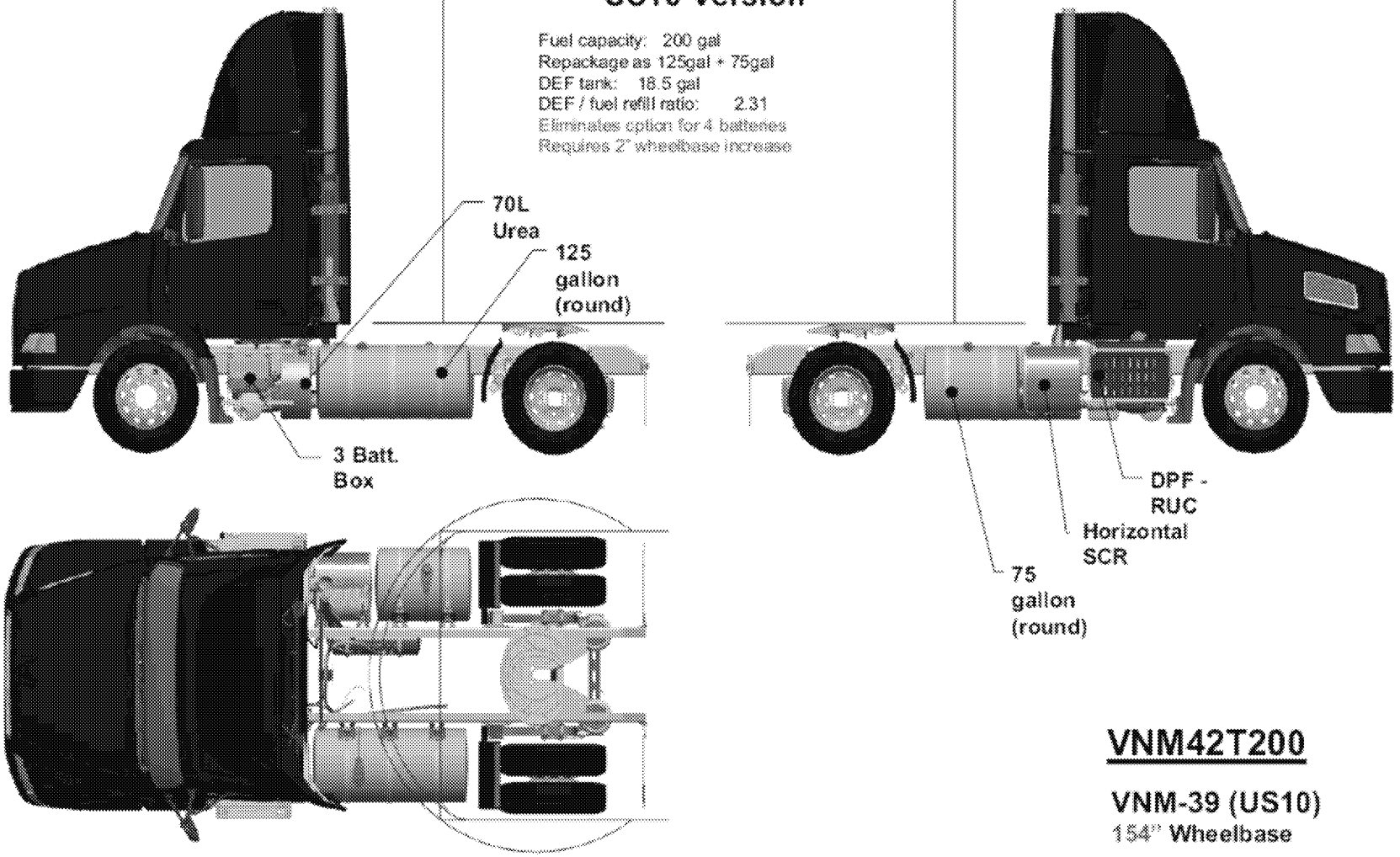

**VNM42T200**

**VNM-5**
**T15_07 (US07)**
**152" Wheelbase**

Volvo Powertrain North America, a division of Mack Trucks, Inc.
Supplement to Request for Reduced Maintenance Interval, US10 SCR

## US10 Version

Fuel capacity: 200 gal
Repackage as 125gal + 75gal
DEF tank: 18.5 gal
DEF / fuel refill ratio: 2.31
Eliminates option for 4 batteries
Requires 2" wheelbase increase



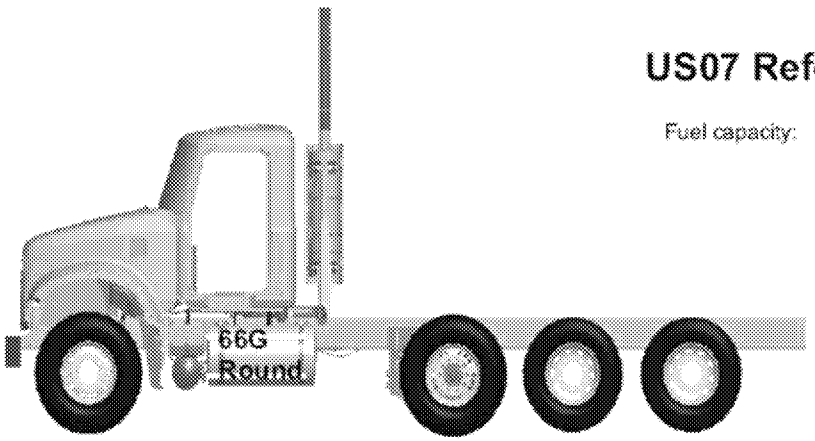

**VNM42T200**

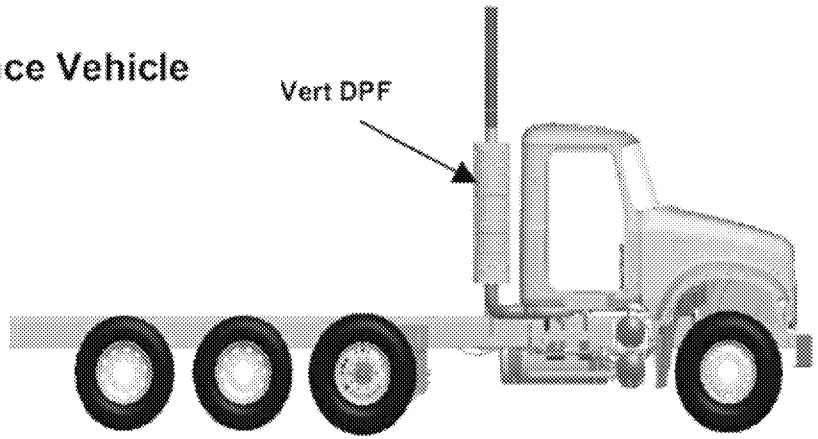
**VNM-39 (US10)**
154" Wheelbase

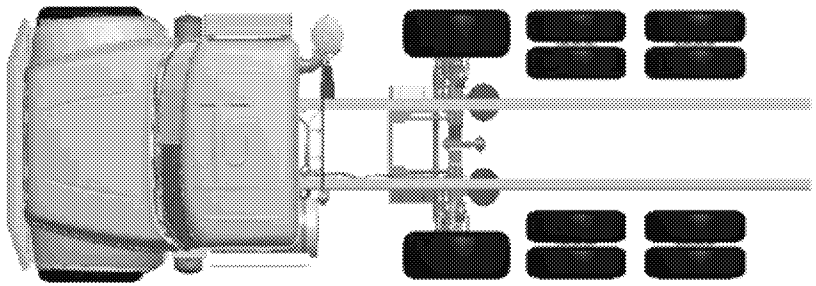
Volvo Powertrain North America, a division of Mack Trucks, Inc.
Supplement to Request for Reduced Maintenance Interval, US10 SCR

## US07 Reference Vehicle

Fuel capacity: 66 gal



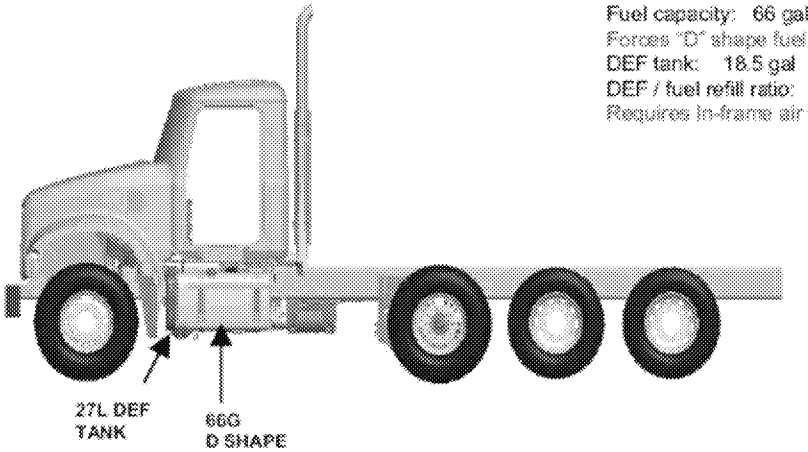



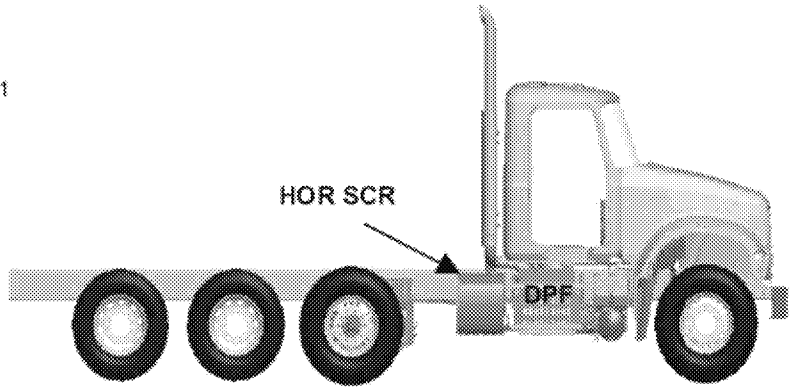



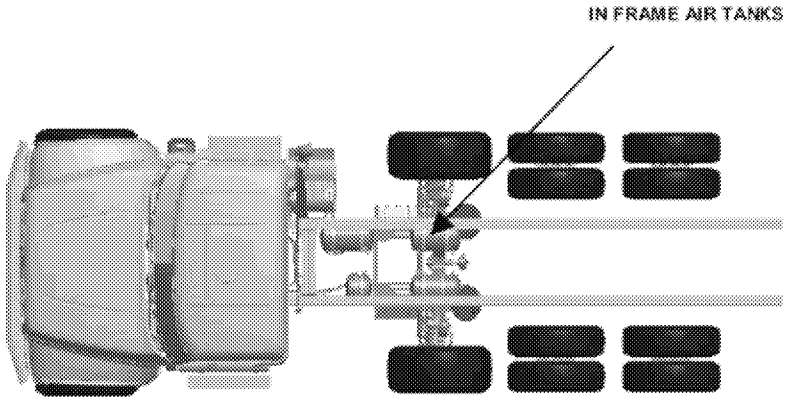
**GU7 8x4**
**REFERENCE**
**CML-38**
**GSO48060 (US07)**
**230"Wheelbase**
**RAP 7590**

# US10 Version

Fuel capacity: 66 gal
Forces "D" shape fuel tank
DEF tank: 18.5 gal
DEF / fuel refill ratio: 2.31
Requires in-frame air tanks



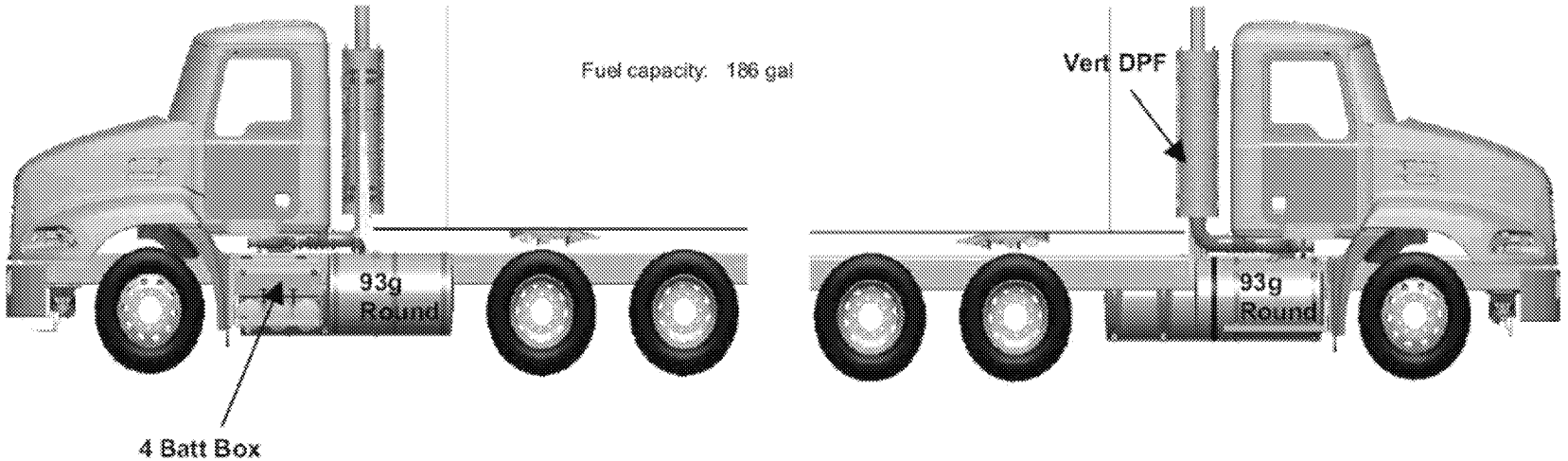



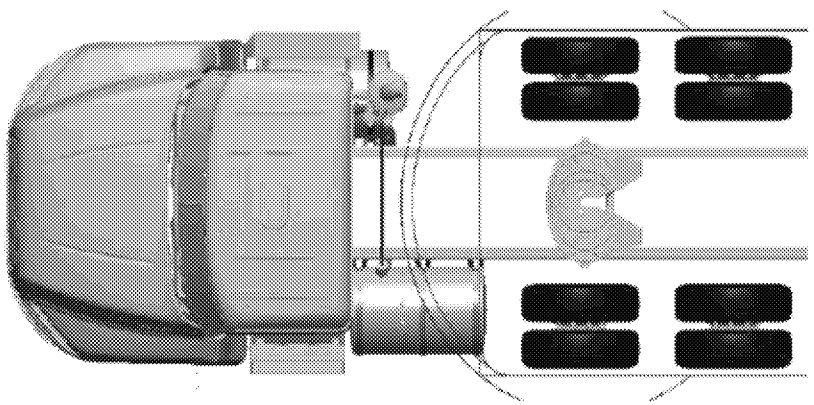




**GU7 8x4**
**CML-38**
**GSO48060 (US10)**
**230"Wheelbase**
**RAP 7590**

Volvo Powertrain North America, a division of Mack Trucks, Inc.
Supplement to Request for Reduced Maintenance Interval, US10 SCR

## US07 Reference Vehicle



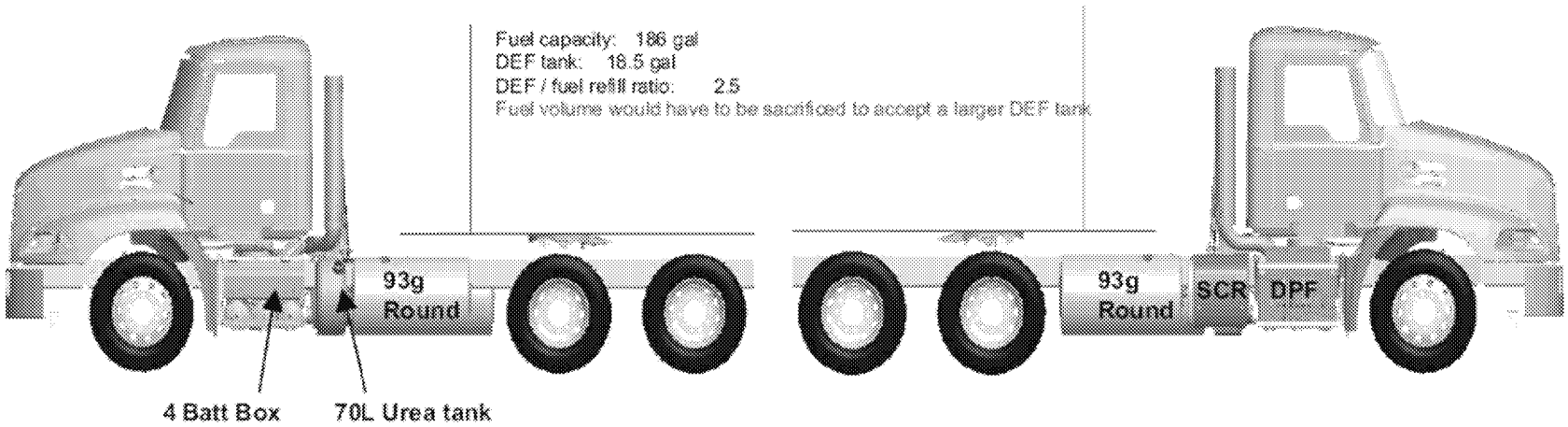



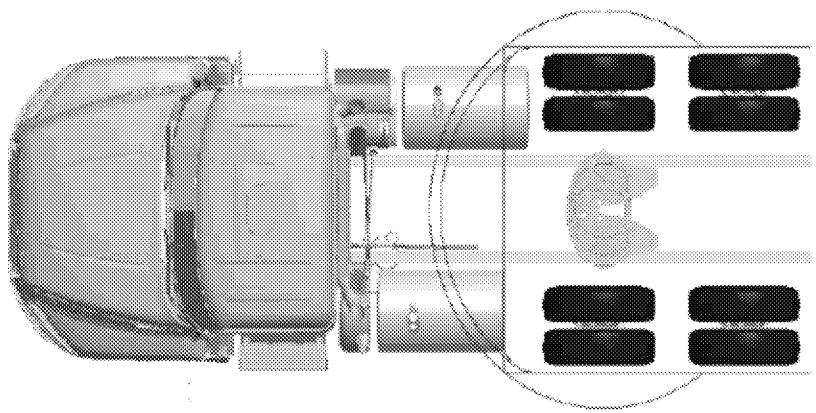
**CXU 6x4**

**GSO47911 (US07)**
**168" Wheelbase**

Volvo Powertrain North America, a division of Mack Trucks, Inc.
Supplement to Request for Reduced Maintenance Interval, US10 SCR

## US10 Version



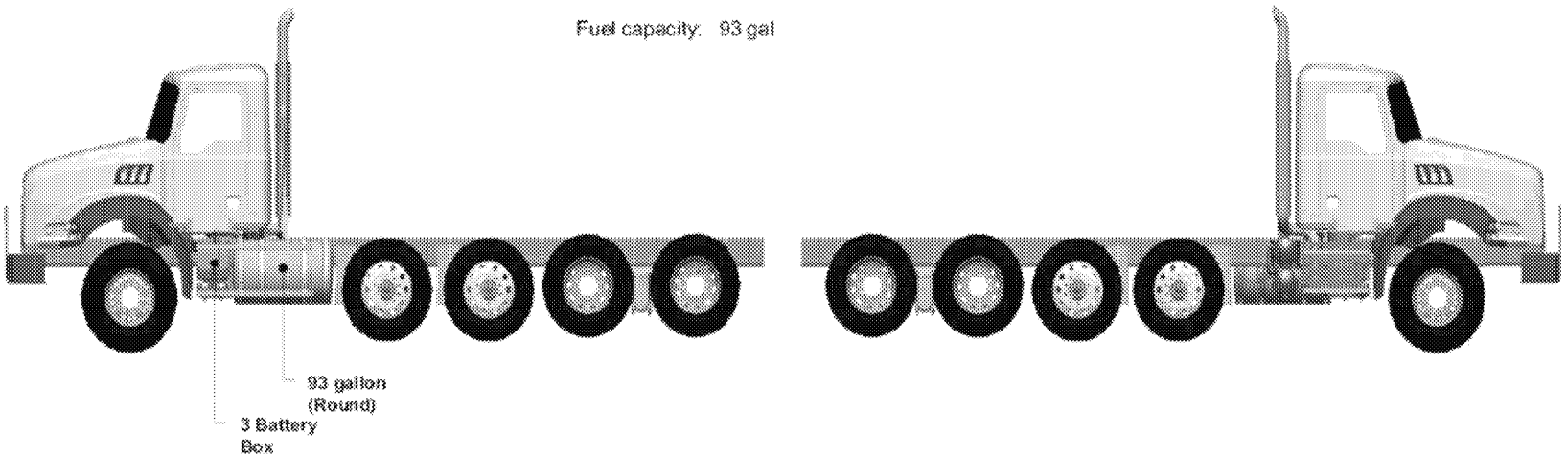



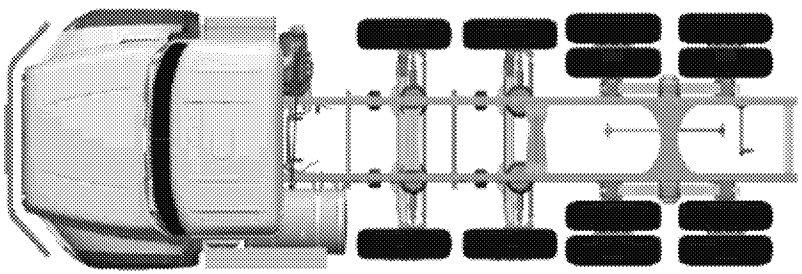
**CXU 6x4**

**CMM-4 (US10)**
**185" Wheelbase**

Volvo Powertrain North America, a division of Mack Trucks, Inc.
Supplement to Request for Reduced Maintenance Interval, US10 SCR

# US07 Reference Vehicle



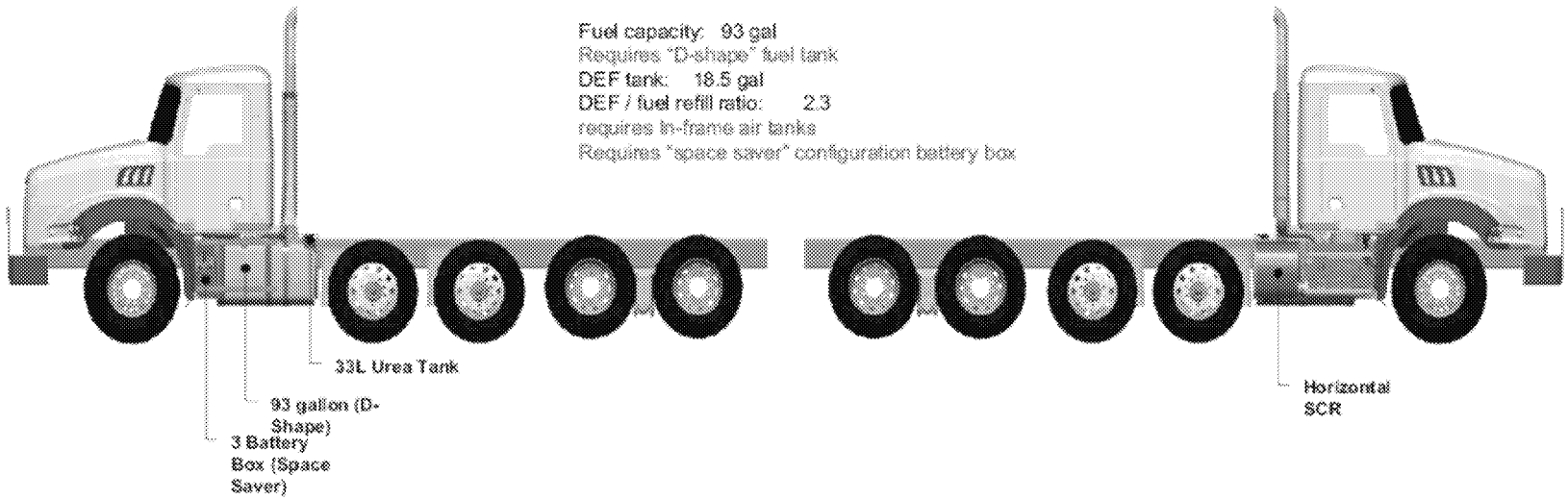



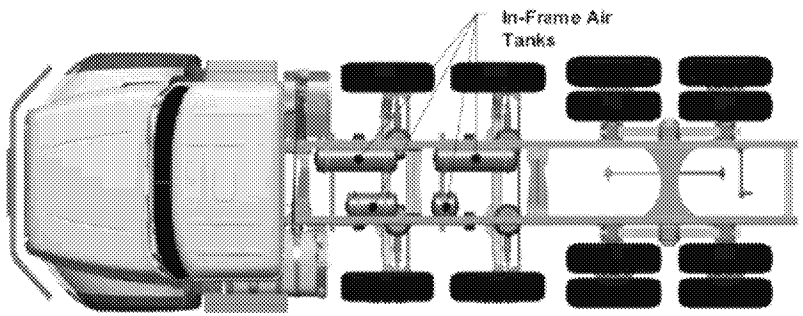
**CML 64R**

**(US07)**
**238" Wheelbase**

Volvo Powertrain North America, a division of Mack Trucks, Inc.
Supplement to Request for Reduced Maintenance Interval, US10 SCR

# US10 Version



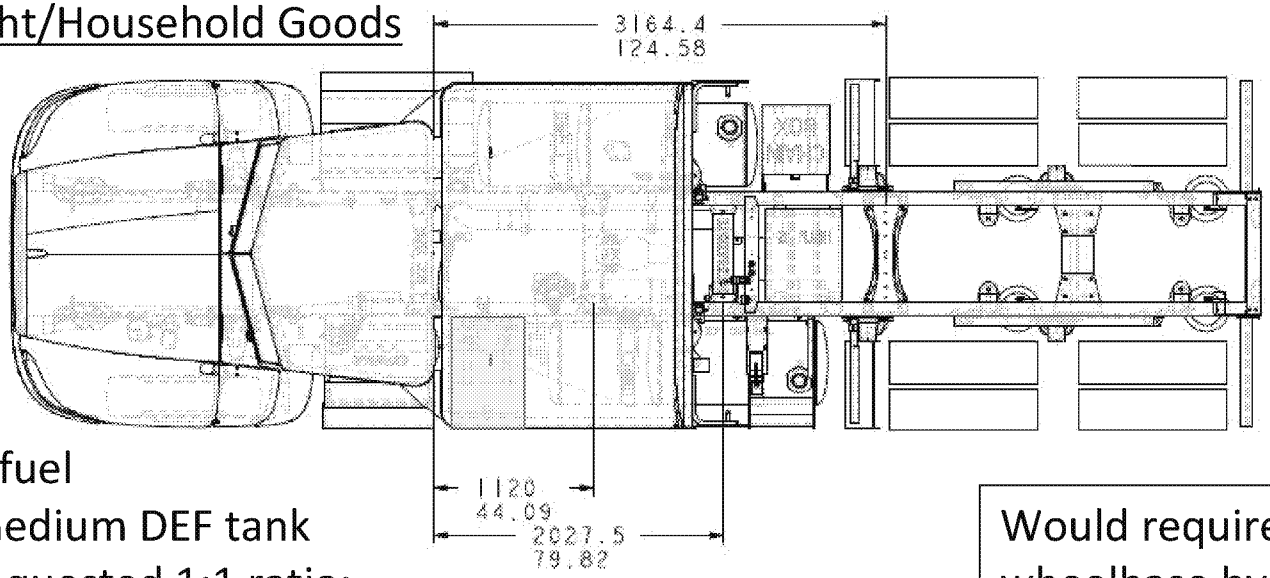

## CML 64R

**CML-77 (US10)**
**238" Wheelbase**

Volvo Powertrain North America, a division of Mack Trucks, Inc.
Supplement to Request for Reduced Maintenance Interval, US10 SCR

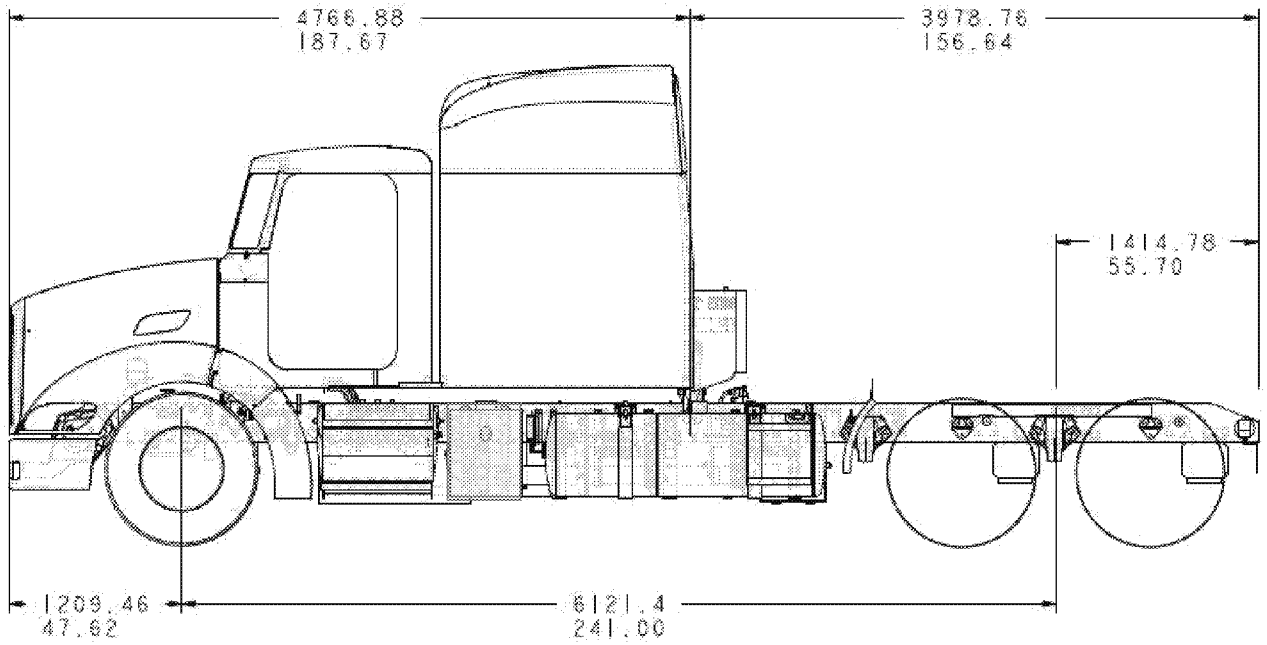
# APPENDIX B

## General Freight/Household Goods



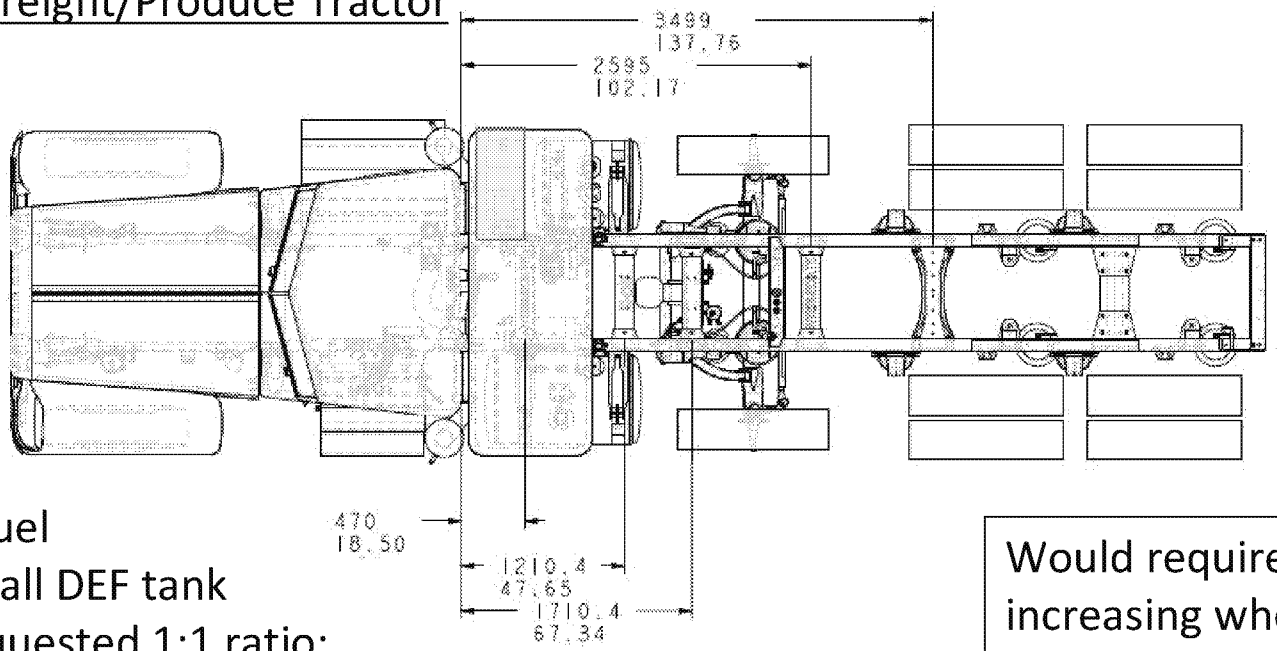

240 gallons fuel
- Current: medium DEF tank
- Without requested 1:1 ratio: large DEF tank

Would require increasing wheelbase by 10 inches



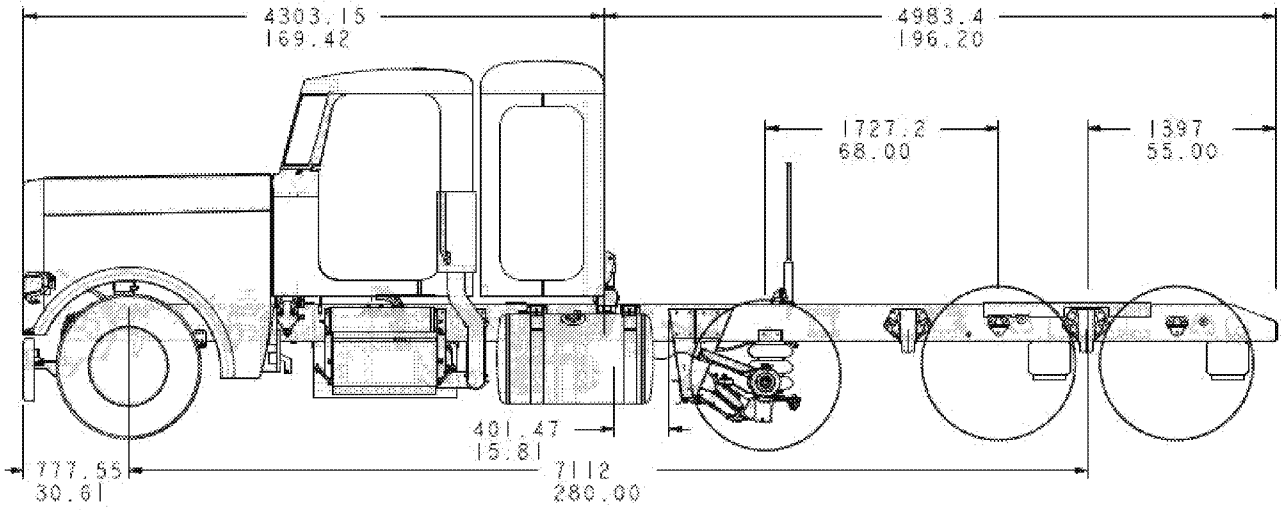

PACCAR Inc

## Refrigerated Freight/Produce Tractor



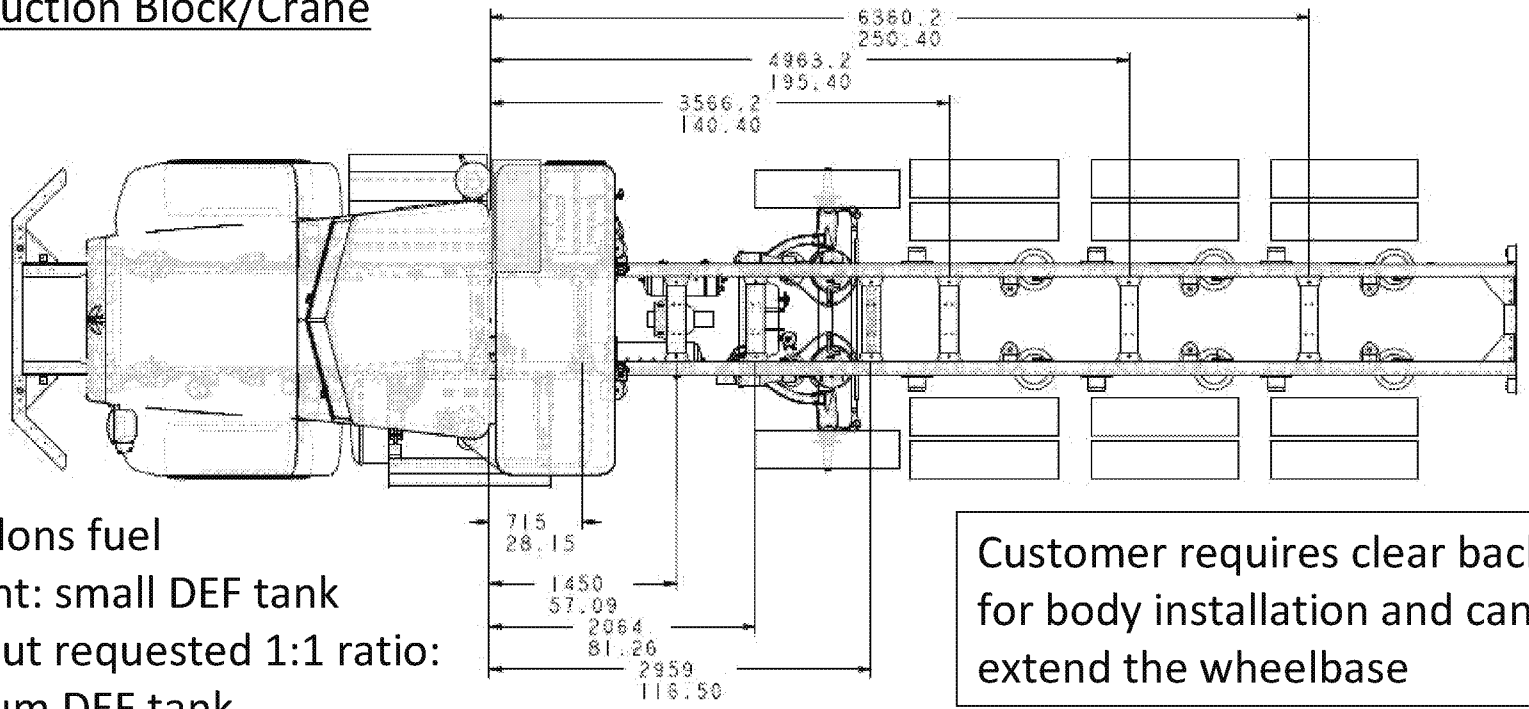

150 gallons fuel
- Current: small DEF tank
- Without requested 1:1 ratio: medium DEF tank

Would require increasing wheelbase by 10 inches



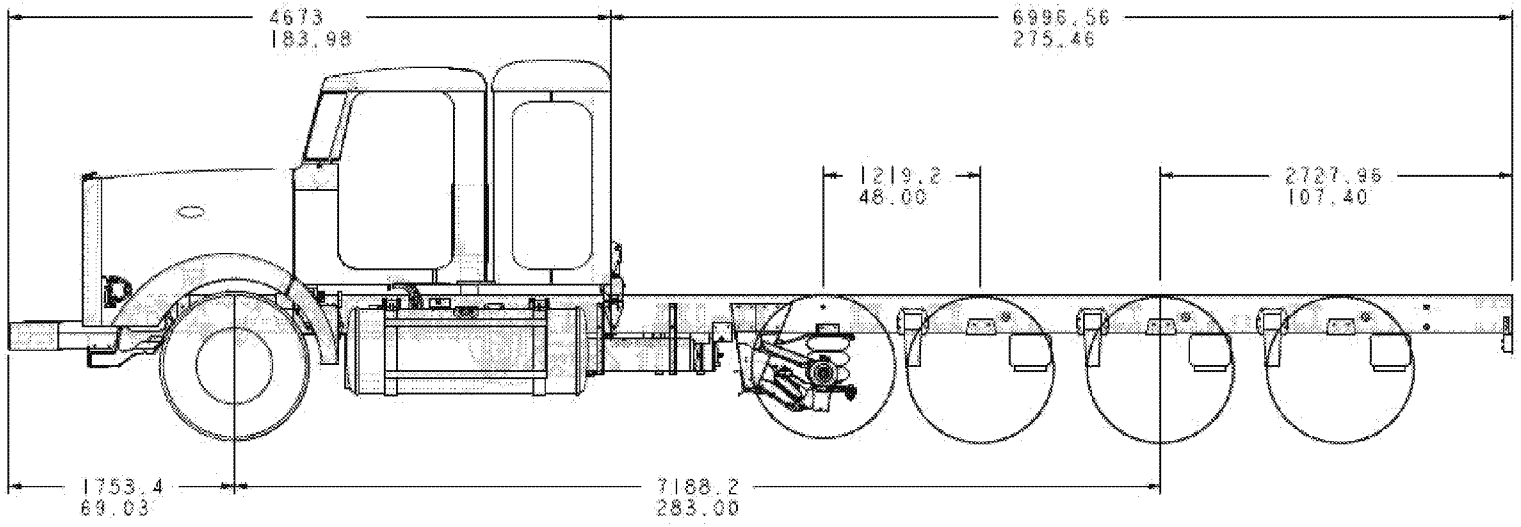

PACCAR Inc

## Construction Block/Crane




150 gallons fuel
- Current: small DEF tank
- Without requested 1:1 ratio: medium DEF tank

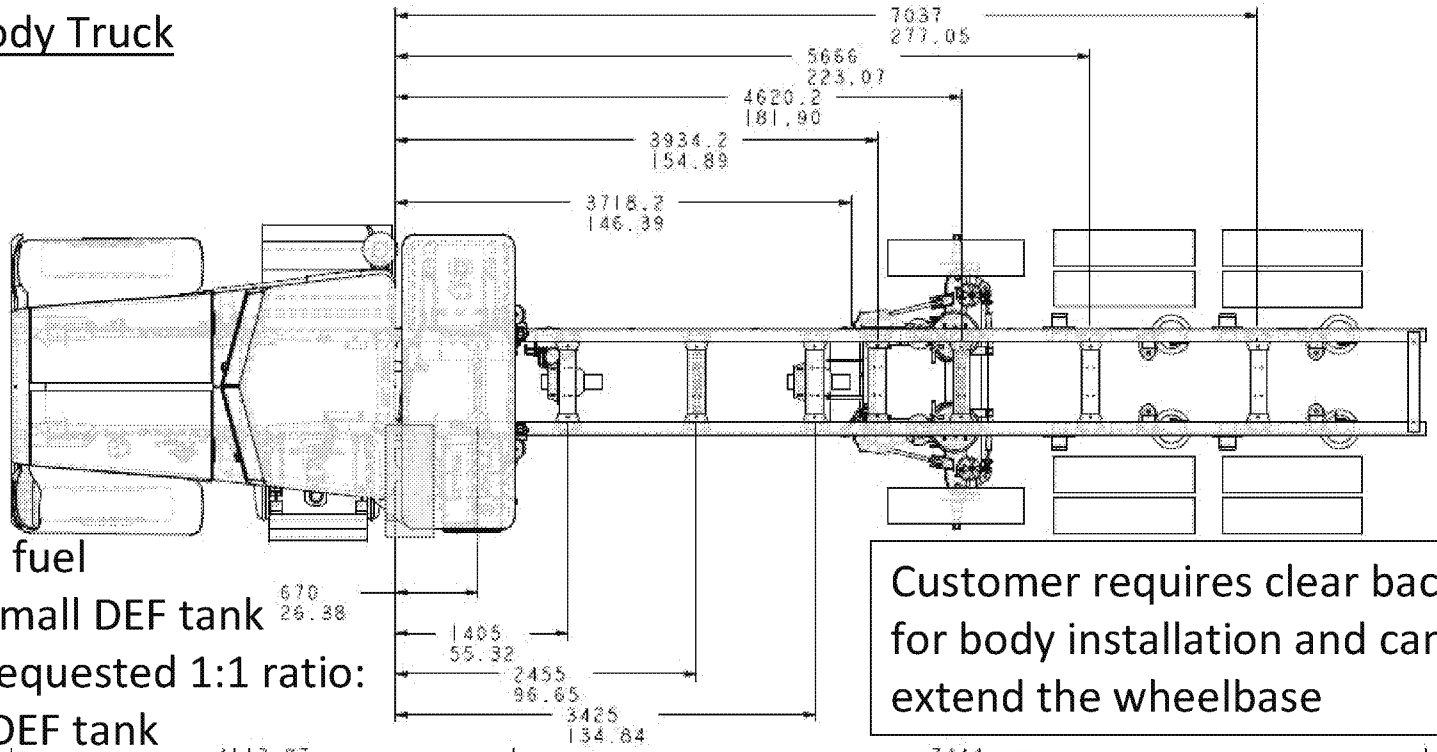
Customer requires clear back of cab for body installation and cannot extend the wheelbase




MODEL: 367
UNITS: MET

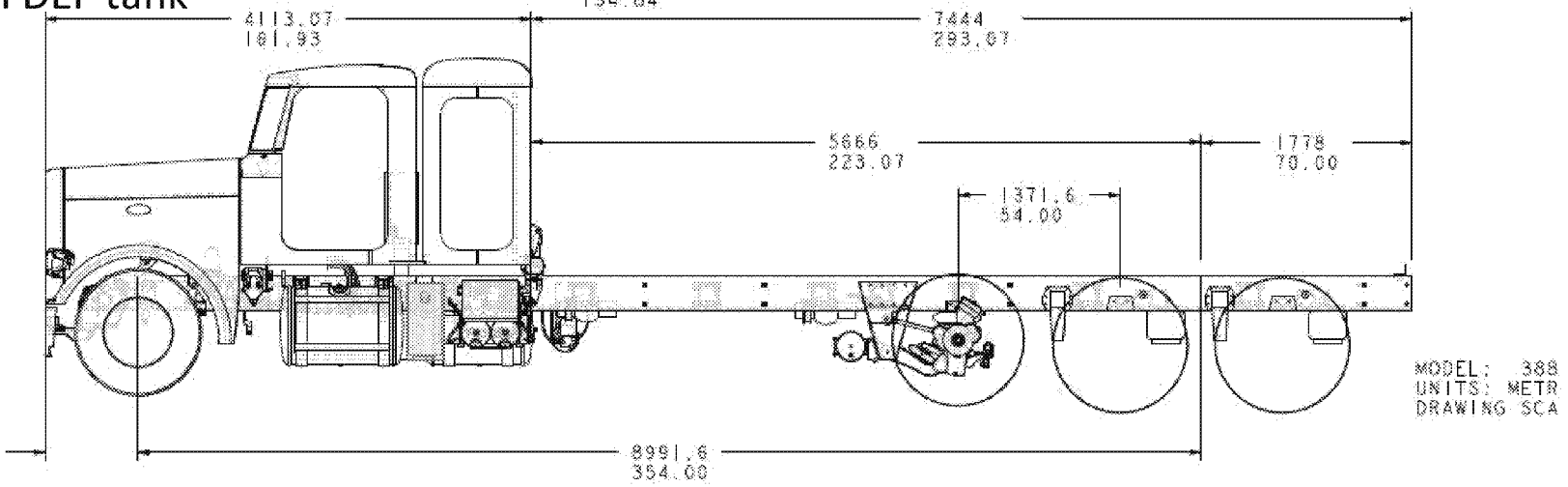
PACCAR Inc

# Wrecker Body Truck



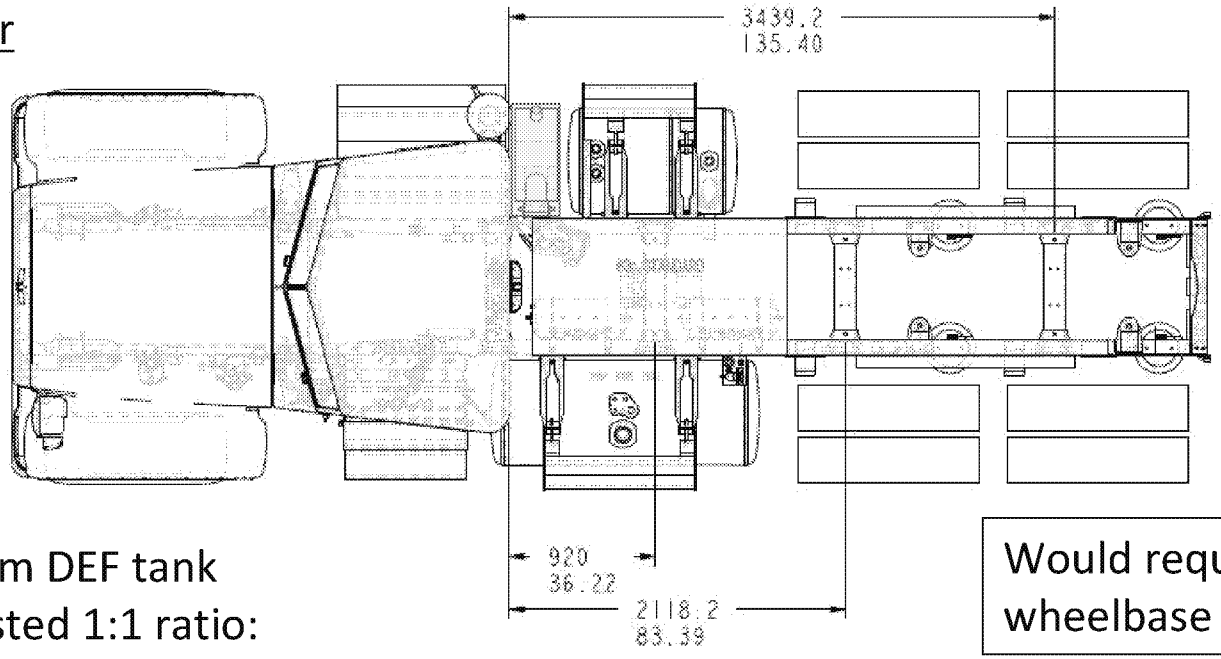

150 gallons fuel
- Current: small DEF tank
- Without requested 1:1 ratio: medium DEF tank

Customer requires clear back of cab for body installation and cannot extend the wheelbase



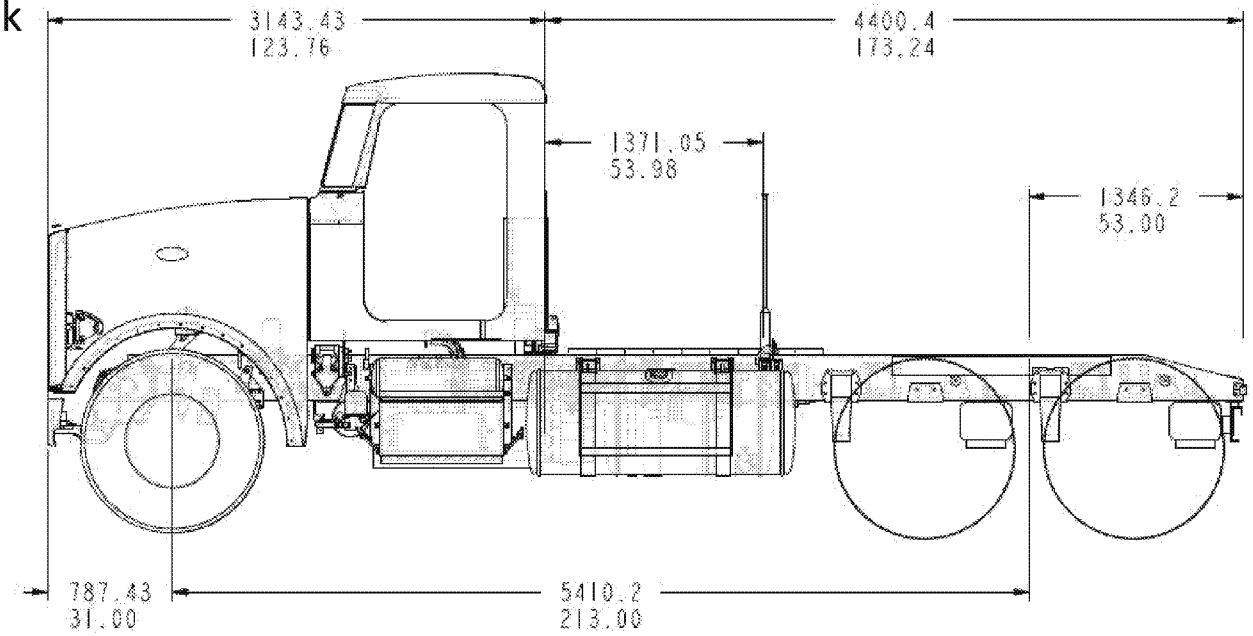

PACCAR Inc

## Winch Tractor



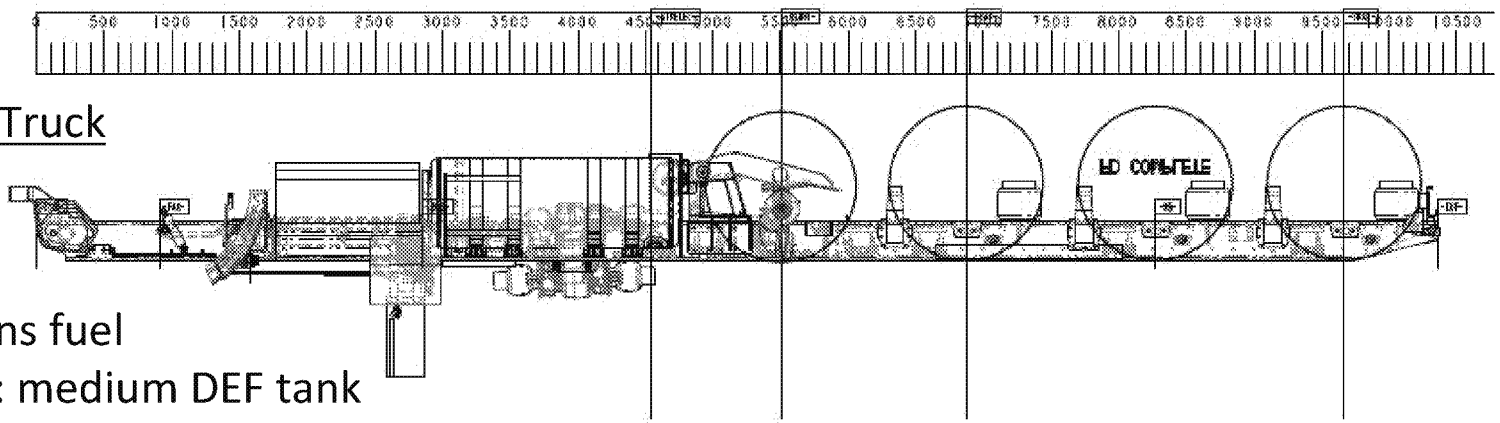

225 gallons fuel
- Current: medium DEF tank
- Without requested 1:1 ratio:
  large DEF tank

Would require increasing wheelbase by 10 inches

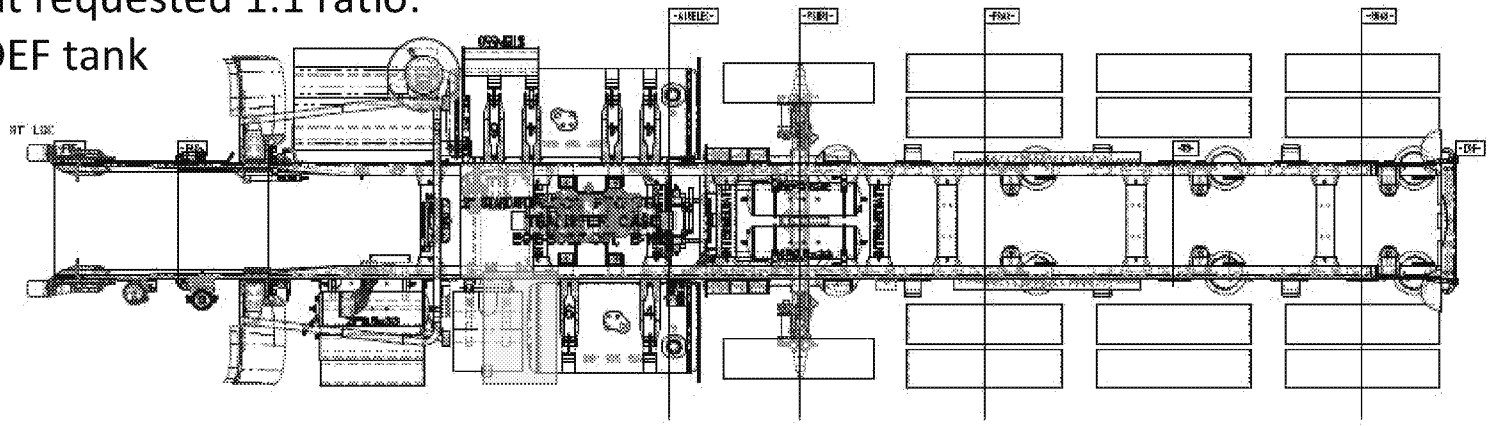



PACCAR Inc

## 4-Axle Truck



225 gallons fuel
- Current: medium DEF tank
- Without requested 1:1 ratio:
  large DEF tank



Would require increasing wheelbase by 10 inches